Materials and Methods: From March 2003 to December 2012, 157 pts (median age 64 years –range 39-84) were enrolled. All pts underwent total abdominal hysterectomy and bilateral salpingo-oophorectomy with or without pelvic lymph-adenectomy; patological stage (FIGO 2008) was I in 150 pts and II in 7 pts. Tumour grading was G1 in 49 pts, G2 in 98 and G3 in 10. All pts underwent high-dose-rate vaginal brachytherapy (total dose 21 Gy in three week-fractions), delivered with vaginal cylinder, with the reference isodose covering the proximal ½ of the vagina. The dose was specified at 5 mm distance from the cylinder surface. The Kaplan-Meier method estimated the probability of loco-regional relapse free survival (LRFS), distant metastases-free survival (DMFS) and cancer-specific survival (CSS). Univariate analysis investigated the effect of age, grading, number of excised nodes and pathological stage on loco-regional relapse (LRR), metastases, and tumour-related death. Risk factors in univariate analysis were included in proportional hazard multivariate models. Vaginal toxicity was evaluated with the RTOG/EORTC scale and was correlated with the cylinder diameter (2.5, 3 or 3.5 cm).
Results: LRFS occurred in 9/157 (5.8%) pts. Three pts (1.9%) developed liver metastases. At median follow-up of 83 months 144 pts (91.8%) are alive and disease free, 2 pts (1.2%) are alive with disease, 7 pts (4.5%) died from disease and 4 pts (2.5%) died from other causes. The 3-year probability of LRFS, DMFS and CSS was 94.5% (95%CI:89.4-97.2), 98.7% (95% CI: 94.9-99.7) and 96,5% (95% CI: 91.8-98.5) respectively. Median survival was nor reached for any end-points. At univariate analysis, risk factors for LRR were stage pII (HR: 3.638; 95% CI:1.3-9.8; p=0.011) and less than 12 excised nodes (HR: 7.057; 95% CI:1.6-29.5; p=0.008), while Stage pII was risk factor for metastasis (HR: 22.7; 95%CI:2.392-215.4; p=0.007) and tumour-related death (HR: 4.043; 95% CI: 1.2-13.2; p=0.021). In multivariate Cox-regression analysis, stage pII and less than 12 nodes sampled were significantly associated with LRR (HR: 3.88; 95%CI:1.390-10.878; p=0.010 and HR: 6.952; 95%CI: 1.591-30.385; p=0.010), whereas only stage pII was associated with metastasis (HR: 23.1; 95%CI: 2.296-231.485; p=0.008) and tumour-related death (HR: 4.324; 95% CI: 1.223-15.290; p=0.023). Treatment was well tolerated. No pts developed acute or late grade III-IV toxicity. No correlation between the diameter of the applicator and the onset of acute (p=0.512) and chronic (p=0.433) toxicity was observed .
Conclusions: Post-operative VBT in pts with early stage endometrial cancer is effective in ensuring vaginal control, with fewer toxic effects.

PO-1021

A practical MRI based reconstruction method for the new endocavitary and interstitial gynecological template

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Purpose/Objective: Current practice on gynecologic brachytherapy requires the use of MRI, following the GEC-ESTRO recommendations (Haie-Meder 2005, Potter 2006). MRI exclusively based treatment planning is preferred because the resulting accuracy. Catheter reconstruction based only on MRI is a challenge (Hellebust 2010). A new template named *Template Benidorm* (TB) has been recently developed (Rodriguez 2014). It adapts the currently existing manufactured MR compatibles intrauterine tubes, together with Titanium needles, resulting fully MRI compatible. In titanium needles dummy-marker catheters cannot visualize signals inside the tubes, so the reconstruction only can be done with the needle itself. An artifact exists at the end of the needle and the tip is assumed to be at the middle of the signal void. The purpose of this work is to improve the titanium needle reconstruction uncertainty for the TB case using a simple method based on the free needle lengths.
Materials and Methods: MRI imaging is performed on a GEMS 1.5 T. A T2 sequence is used for contouring and a 3D radio-frequency Spoiled Gradient recalled Echo sequence to maximize the titanium needles signal (Petit 2013)
On the TB, for the tandem case the reconstruction is done using the existing MRI dummies (Perez-Calatayud 2009). For the needles, the proposed reconstruction method is based on the free length obtained outside of the external template plate as follow:
The TB has both non-divergent and divergent needles. The proposed procedure consists on the inclusion of three small A-vitamin pellets compressed by both applicator plates. The pellets plane gives the central plane of the plate's arrangement. Because A-vitamin produces an adequate signal on MRI, these pellets can be easily identified on the acquisition study, obtaining their coordinates. From these, a plane is defined. For each needle, two points are obtained and then the straight line defined. From straight line and plane equations the intersection is obtained and using the free length (knowing the offset distance) the coordinates of the needle tip are obtained. Knowing the tip coordinates, these can be introduced on the TPS by keyboard. Although we use it in our TPS Oncentra (Elekta) the procedure is applicable to any TPS.
Results: This technique has been applied to the last 3 patients treated with the TB. The method has been programmed on a spreadsheet and its application is very efficient, avoiding the laborious needle reconstruction and their tips uncertainties because the void artifact.The A-vitamin pellets are easily identified and for each needle just two points are required.
Conclusions: A simple and practical method has been developed to optimize the titanium needle reconstruction on the Template Benidorm used in gynecological brachytherapy. It improves the uncertainty and the efficiency allowing exclusively MRI based planning.

PO-1022

Outcome of cervix cancer patients treated with CT based plans - data from a limited resource setting

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